

3rd Annual Student Independent Research Symposium



The future belongs to young people who know where the knowledge is, how to get it, how to think about it, and how to turn it into better work, better products, better lives. *-- Rexford Brown, Educator and Author*

May 18, 2015
6:00 PM
Randallstown High School



**Welcome to the 3rd Annual Baltimore County Public Schools
Student Independent Research Symposium - May 18, 2015**

AGENDA

Please use the provided Comment Cards to share feedback with student researchers.

6:00 - 6:20 Poster Sessions

Enjoy some light refreshments as you visit student research exhibits.

6:20 – 6:35 Recognition of Student Researchers

Be seated in the Library for congratulations and presentation of Certificates of Achievement.

6:35 - 8:00 Oral/Multimedia Presentations

View and listen to student research presentations in the Library or Computer Lab; see Presenter Schedule & Locations (provided separately).

STUDENT RESEARCH ABSTRACTS

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Cecilia Christman	Senior, Catonsville High	Poster Session
<p>Research Title: The Power of an Artist: Bernini and the Counter-Reformation</p> <p>Statement of purpose: I am studying Bernini in order to explore the impact he had on art in the Catholic Church, and the significance of his work for the Counter-Reformation.</p> <p>Background: The Council of Trent was convened in 1545 by Pope Paul III in response to Martin Luther's 95 theses and the Protestant Reformation he triggered. The Council of Trent strengthened the Catholic Church in many ways. One of these was the formulation of guidelines for art that all Catholics, from the Papacy to artists, were required to follow. These guidelines were promulgated in order to strengthen people's faith and to ensure that artists produced works that could not be labeled idolatrous by Protestants.</p> <p>Significance: The study of art history confirms that artists influence society in a variety of ways – from sparking cultural revolutions to strengthening a powerful institution such as the Catholic Church. Moreover, examining the past – including the history of art – enables us to better understand not only the past, but also the present in which we live.</p>		

Kayla Nelson	Senior, Catonsville High	Poster Session
<p>Research Question: What is the best solution to combat the deterioration of United States bridges?</p> <p>Statement of purpose: The infrastructure in the United States has become outdated and of little effectiveness and safety.</p> <p>Background: Past estimates about the life span of technology such as tunnels, roads, and especially bridges have become irrelevant. The number of cars using bridges has increased dramatically since the early 1900's.</p> <p>Significance: In 2013, the American Society of Civil Engineers gave America's infrastructure a GPA of a D+.</p>		

Tahira Ammar	Senior, Franklin High	Oral/Multimedia Presentation
<p>Research Question: How can the pathological symptoms and stages of traumatic brain injury (TBI) be tracked using advanced brain imaging techniques?</p> <p>Statement of purpose: To explore imaging techniques that will reveal the most detail about a traumatic brain injury, to identify the phases of the injury and possible treatments, and to explore biological markers that could make diagnoses and treatments more specific.</p> <p>Background: I became interested in neurology in after viewing a NOVA scienceNOW documentary called "How does the Brain Work?" which explored various aspects of the human brain and showed how complex an organ the brain really is. I became interested in traumatic brain injury after hearing about former NFL players who were still suffering from the effects of concussions, and seeing another NOVA scienceNOW segment specifically about brain injury.</p> <p>Significance: Traumatic brain injury is a serious health issue even in developed countries. Injuries affecting the brain – even concussions, the mildest type of traumatic brain injury – can have long-lasting effects on a person’s overall health, because such injuries disrupt brain connectivity and therefore impede the efficient functioning of the nervous system. However, traumatic brain injury is not easy to diagnose or to treat because such an injury cannot be detected by conventional imaging methods such as MRI scans. Additionally, the effects of a brain injury vary greatly from patient to patient and cannot be predicted, so gathering as much detail as possible on a specific injury is crucial to a correct diagnosis and an effective treatment for a given patient.</p>		

Rebecca Gross	Senior, Franklin High	Oral/Multimedia Presentation
<p>Research Title: Cave Life and the Guano Crisis: An Exploration of Extreme Life's Ecology</p> <p>Statement of purpose: How do organisms survive in oligotrophic conditions like caves? What happens to these communities when the main source of nutrition is no longer available? Can bats hibernate in artificial structures in which the conditions differ from those of preferred hibernacula? Would this hibernation change help bats to avoid the scourge of White Nose Syndrome?</p> <p>Background: Although I have always been interested in the occurrence of extreme life, my studies into life in caves were sparked when I read an article by Kevin Krajick about troglobites, or tiny arthropods that exclusively inhabit caves. A species of crayfish examined in the article can live for centuries due to its slow metabolism, a must if an organism wants to survive in the nutrient-poor conditions of caves. Not only can troglobites survive in this environment, but so can bats. Bats are also well adapted to cave life and rely on these karst systems for shelter. Bats are an emblem of cave environments. My curiosity about their contribution to caves led me to investigate how caves are impacted if bats are not present. How does this affect the caves' ecosystems?</p> <p>Significance: White Nose Syndrome is characterized by massive bat population losses (more than 6 million) due to the growth of white fungus on a bat's wings and nose. This fungus flourishes in the conditions that are optimal for bat hibernation. If bats occupy hibernacula that are not contaminated with WNS and have conditions preventing its occurrence, bat losses may be slowed. However, if bats choose alternate hibernacula, the cave ecosystems that once relied on the bats' input of nutrients via guano may suffer.</p>		

Evan Glaser	Senior, George Washington Carver Center	Oral/Multimedia Presentation
<p>Research Title: Review of Next-Generation Lithographic Technologies</p> <p>Statement of purpose: This research seeks to determine the most viable lithographic technology for next-generation semiconductor manufacturing.</p> <p>Background: For over three decades, the semiconductor industry has followed Moore's Law. This phenomenon has enabled transistor counts to double every two years, which has allowed for progressively more complex electronic components to be manufactured. However, Deep Ultraviolet Lithography, the workhorse of semiconductor manufacturing, is quickly approaching its technological limits, and no clear successor is in sight.</p> <p>Significance: Identifying the successor to Deep Ultraviolet Lithography is critical for ensuring the continued progress of computer hardware and allowing more powerful processors and memory technologies to be developed.</p>		

Jalon Dixon	Junior, Parkville High	Oral/Multimedia Presentation
<p>Research Title: How to Write a Best- Selling Novel</p> <p>Statement of purpose: From a very young age, I always enjoyed writing. Whether it is poems, short stories or even just one paragraph expressing the crazy things my imagination can come up with, writing was something I just always loved to do. Writing is something I'm very passionate about, and when I was younger I always thought about taking that bigger step by writing a novel. There were a few times where I actually tried to write a novel, but never finished it. Continuing to write helped me to display and improve my writing in school and to persevere through writer's block, and gave me the influence and drive to fully write a novel. Therefore, I decided to conduct research about what types of things in entertainment are most appealing in order to create an engaging novel for readers.</p> <p>Background: Before starting my manuscript, I conducted research to see what things in the entertainment world, including books, television shows or movies, are the most appealing to people in society. I discovered that with movies like <i>Captain America: The Winter Soldier</i>, <i>Avengers</i> and even popular television shows like <i>Arrow</i> and <i>The Flash</i>, superheroes were becoming a big thing from an entertainment standpoint. I also was able to find out what elements are necessary in order to develop an intriguing superhero story such as back-story, superpowers and the not only the conflict between the superhero and the villain, but also the internal conflict within the superhero. Learning about these elements and conducting research utilizing those new movies, television shows and even comic books enabled me to envision what readers might enjoy and to begin the draft of my manuscript.</p> <p>Significance: From this research, I learned that readers utilize books in order to escape from the realities of society into a world of imagination. Books provides readers, whether they are younger children fascinated with superheroes or older comic book fans looking to see how superhero stories have progressed, with a level of adventure, action and mystery not usually matched by real life. Now that I have a better understanding of what readers look for in a superhero storyline, I am able to supply readers with this imaginative thinking through my writing.</p>		

Emily Dexter-Thornton	Junior, Patapsco High	Oral/Multimedia Presentation
<p>Research Question: How can we provide communication to military personnel in hostile, war- torn urban areas?</p> <p>Statement of purpose: The use of autonomy in order to increase the military's communications capabilities.</p> <p>Background: Since the year 2010 there have been 1,410 US military casualties in Afghanistan.</p> <p>Significance: With the use of technological advances, it is possible to produce an autonomous robot that will construct communication towers within these hostile regions.</p> <p>Description: The military is in constant search of how to increase their communications in overseas war zones. Limitations in hostile urban areas cause delays in conveying military strategies which could result in fatalities.</p> <p>Methodology: With the resources of the school's vex robotics team, I will be able to create a visual prototype of the product. I have also had the opportunity to speak with multiple engineers: Ron Hoge, Lindsay Green, and Alexander Manasseh. I will be conducting research to gain knowledge on what advances and needs the military has identified. I also had the opportunity to meet with Sgt. Davis to gain insight from his first-hand experience and knowledge.</p>		

Katelyn Larossa	Senior, Perry Hall High	Oral/Multimedia Presentation
<p>Research Question: How has economic competition between Iran and Russia over natural resources affected the relationship between the two nations?</p> <p>Statement of purpose: Iran and Russia possess a history riddled with interference from one another, originally centering upon the Caspian Sea Basin as the two nations fought for territory and resources. Upon researching historical and modern treaties and relations between these two nations, my goal is to determine the direction of their relationship in the near future.</p> <p>Background: I possess a special interest in Iran and its interactions with its neighboring nations. This past summer's crisis in Ukraine with Russia alerted me to Russia's expansionist policy, causing me to question the relationship between an expansionist Russia and a historically volatile Iran. This year I am taking AP Economics, thus spawning my interest, and consequently research, into the economic relationship between Iran and Russia.</p> <p>Significance: This research will provide both background information regarding the interconnected histories of Iran and Russia, as well as provide insight to those hoping to understand where this complex relationship is headed in the future. I hope to clarify some of the misconceptions and limited information reported about the relationship between these two nations.</p>		

Mark Bradley, Jr.	Junior, Randallstown High	Poster Session
<p>Research Question: Can Video Games Have a Positive Effect on Your Life?</p> <p>Statement of purpose: Identify how video games can improve your quality of life.</p> <p>Background: Many people think that video games are a distraction and can make children violent; but video games can help improve how you live.</p> <p>Significance: From my research I learned how people view video games as a problem. My research will help people to understand how video games can be good for you.</p>		

Kamal Dawes	Junior, Randallstown High	Oral/Multimedia Presentation
<p>Research Title: Sneakerheads: Connoisseurs or Compulsive Consumers?</p> <p>Statement of purpose: When most people hear the word "sneakerhead" they are clueless to what it is. Others perceive sneakerheads as mere compulsive consumers of sneakers (tennis shoes) rather than aficionados of footwear. I want to inform mainstream society about sneaker collecting in order to change the negative misperceptions of sneakerheads.</p> <p>Background: I have always been into sneakers because my favorite sport is basketball. Most of the males in my family play basketball. We wear brands like Nike and Jordans. When I was in elementary school my older sister bought me a pair of military blue Jordan 4's. I wore those sneakers all the time, because I loved the way they looked. As I got older, my interest in sneakers began to grow because my sister continued to purchase them for me. I began to appreciate and realize that sneakers had so many designs, colors, and brands. I also came to realize that being a sneakerhead is an element of the hip hop culture and fashion.</p> <p>Significance: Understanding the difference between a sneaker connoisseur and a compulsive consumer of sneakers will help diminish misconceptions about this growing, trendy subculture that contributes billions of dollars to the U.S. economy. These misconceptions are negative rather than helpful, so I want to correct them.</p>		

Terona Dawes	Junior, Randallstown High	Oral/Multimedia Presentation
<p>Research Question: Why is outer beauty valued more than inner beauty?</p> <p>Statement of purpose: The purpose of this research is to find ways to change students' definition of outer beauty in an effort to reduce the incidence of bullying in schools.</p> <p>Background: I have always had an interest in cosmetics and beauty; however I did not like how most people valued outer beauty. I watched a lot of beauty pageants and even wanted to be in one. As I got older, I started to realize it's not about outer beauty, but inner beauty. I also noticed how people who looked different or were considered "unattractive" were treated differently and were often bullied.</p> <p>Significance: By helping others to gain a deeper appreciation for inner beauty, I hope to reduce the incidence of school bullying.</p>		

Safkia Millington	Junior, Randallstown High	Oral/Multimedia Presentation
<p>Research Topic: Building a Serial Killer: Inside the Minds of Ted Bundy and Jeffrey Dahmer</p> <p>Statement of purpose: The purpose of my research is to identify underlying genetic and environmental reasons why serial killers commit such heinous crimes.</p> <p>Background: During the past five years my interest in serial killers has grown. I have always been fascinated with TV shows like Law & Order, NCIS, and CSI. This past year, I have become a fan of Criminal Minds. Some may consider this to be a peculiar interest; however I plan to pursue a career with the United States Federal Bureau of Investigation's (FBI) working as a communication liaison in the Behavioral Analysis Unit (BAU). This is a department of the FBI's National Center for the Analysis of Violent Crime (NCAVC).</p> <p>Significance: I hope to explain in my research how genetic and environmental reasons can contribute to the making of serial killers. If society has a better understanding of these genetic and environmental factors, perhaps we can begin to prevent the creation of future serial killers and save innocent lives.</p>		

Mercy Rufai	Junior, Randallstown High	Oral/Multimedia Presentation
<p>Research Topic: Teenage Mass Shooters and Antisocial Personality Disorder</p> <p>Statement of purpose: The purpose of my research is to identify how Antisocial Personality Disorder can cause some teens to become mass shooters.</p> <p>Background: During the past three years, more than three school shootings have occurred in the United States. There have even been incidents in my school involving students with weapons. I then began to wonder why or what would drive a person, especially a teenager, to commit a mass shooting.</p> <p>Significance: I am conducting this research in hopes of improving school safety by identifying what chemical imbalances in the brain and what environmental factors can trigger some teens to become mass shooters. With early detection of these root causes, we may be able to prevent future school shootings.</p>		

Acknowledgements



We wish to thank ...

Administrators and counseling chairs at Catonsville, Franklin, George Washington Carver, Parkville, Patapsco, Perry Hall, and Randallstown High Schools for offering this unique course at their schools.

Library media specialists, school to career transition coordinators, and content area teachers at each high school for facilitating independent student research this year.

Mentors who have provided students with research support and expert guidance.

Parents and families for supporting their students with the rigorous demands of this course.

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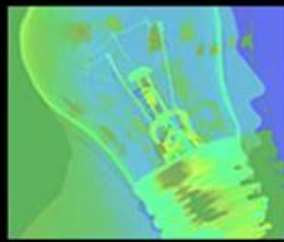
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Research Process Steps



Step 1
Encounter the Task



Step 2
Explore an Issue or Problem



Step 3
Conduct a Literature Review



Step 4
Develop a Research Proposal

Step 5 Conduct Subject-Specific Research



Fine Arts



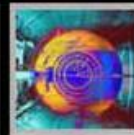
Mathematics



Sciences



Social
Sciences



Technologies



Step 6
Apply New Understanding



Step 7
Communicate/Present/Share



Step 8
Reflect/Extend

Independent Research Seminar Course Research Framework

<http://www.bcps.org/offices/lis/researchcourse/index.html>

BCPS High School Administrators and School Counselors:

For information about offering the Independent Research Seminar course at your school, contact the Office of Digital Learning at 410-887-4035.

